DESIGN MANUAL TABLE OF CONTENTS Page 1 Revised 4/8/09			
CHAPTER I INTRODUCTORY AND GENERAL DESIGN INFORMATION			
<ul><li>I-01 Introduction</li><li>I-02 Use of Manual</li><li>I-03 Effective Dates and Revisions</li></ul>			
Appendix I-03A Proposed Revision/Addition To NDDOT Design Manual			
<ul> <li>I-04 State Highway System</li> <li>I-05 Organization/Responsibilities of Design and Bridge Divisions Responsibilities</li> <li>I-06 Design Philosophy, Investment Strategy, and Guides</li> <li>I-07 Plan Sheet Order</li> <li>I-08 Final Plan Submittal Process</li> </ul>			
Appendix I-08A Electronic Plan Sheet Submittal Checklist			
<ul><li>I-09 Project Selection, Development Scheduling and Control</li><li>I-10 Plan Reviews</li></ul>			
Appendix I-10A Plan Review Notification, Distribution, and Attendance List			
<ul><li>I-11 Plan Revisions and Change Orders</li><li>I-12 Design Records, Identification, Retention</li></ul>			
Appendix I–12A Guidelines for Use of the 409 File Stamp			
I-13 FHWA Involvement in the Design Process			
Appendix I-13A Partnership Agreement Appendix I-13B Stewardship Agreement Interaction Between NDDOT and FHWA			
<ul><li>I-14 Design/Plan Preparation By Others</li><li>I-15 Reference Publications</li></ul>			

Definitions
Abbreviations and Symbols
Manual Revisions

I-16 I-17

I-18

DESIGN MANUAL	TABLE OF CONTENTS
Page 2	<b>Revised 4/8/09</b>

# CHAPTER II PROJECT CONCEPTS AND ENVIRONMENTAL STUDIES

II-01 Introduction

II-02 Milestone Program

Appendix II-02A Table of Milestone Activities/Tasks and Responsible Division

II-03 Coordination

Appendix II-03A Railroad Crossing Review

Appendix II-03B Mitigation Criteria for Ditch Wetlands

Appendix II-03C Distribution List

II-04 Public Involvement

II-05 Environmental Documentation

Appendix II–05B Cultural Resource Procedures Outline

Appendix II-05C Project Concept Report Outline

Appendix II-05G Life Cycle Cost Effective Tables

Appendix II-05H Project Cost History

Appendix II-05I Certification Page

II-06 PCR (Categorical Exclusion) Approval Process

II-07 Distribution of Environmental Documents

DESIGN MANUAL	TABLE OF CONTENTS
Page 3	Revised 4/8/09

### CHAPTER III ROADWAY DESIGN

#### III-01 Plan Preparation

Appendix III-01A Plan Preparation: Detailed Plan Design and Development Checklists

Appendix III-01B Plan Preparation: Plan Review

Appendix III-01C Plan Preparation: Final Office Plan Review Checklist

III-02 Design Speed and Geometric Guides

III-03 Alignments and Roadway Geometry

III-04 Earthwork

III-05 Bases, Edge Drains, and Prime

III-06 Surfacing

III-07 Pedestrian and Bicycle Facilities

III-08 Utility Relocation, Adjustments, and Accommodation Policies

III-09 Permanent Signing

Appendix III-09A Permanent Signing Details

Appendix III-09B North Dakota Department of Transportation Interchange Numbering on I–94 Appendix III-09C North Dakota Department of Transportation Interchange Numbering on I–29 Appendix III-09D Sign Support Design

#### III–10 Marking

Appendix III-10A Pavement Marking Material Selection Appendix III–10B Left-Turn Lane, Stop Bar, Cross Walk Lines and Bicycle Lane Markings Appendix III–10C Bicycle Lane Details

III–11 Lighting

III-12 Traffic Control Signals

III-13 Guardrail

Appendix III–13A Various Guardrail Layouts and Details

#### III-14 Safety Reviews

Appendix III-14A Figures
Appendix III-14B Clear Zones, Horizontal Curve Adjustment

#### III-15 Safety Clear Zones

Appendix III–15 A Foreslopes and Backslopes for Basic Ditch Configurations Appendix III-15B Deep Fill Areas

# DESIGN MANUAL \_\_\_\_\_ TABLE OF CONTENTS Page 4 Revised 4/8/09

III- 16 Driveways and Access Management

III-17 Airport Clearances

III-18 Plan Notes

III-19 Work Zone Traffic Control

III-20 Special Provisions

III-21 Cost Estimates

III-22 District Design

Appendix III-22A ExPatch Hot Bituminous Patching

Appendix III–22B ExSeal

Appendix III-22C Typical Pay Item Descriptions and Design Calculations

III-23 Standard Drawings

# CHAPTER IV STRUCTURAL DESIGN

IV-01 General Guidelines

IV-02 Bridge Division Operating Policies and Procedures

IV-03 Railroad Structures

IV-04 Appendices

Appendix IV-04A Prestressed Girder Design

Appendix IV-04B Flared Back Parapet Wall and Safety Shape Transition

Appendix IV-04C Approach Slab Details

Appendix IV-04D Predetermination of Pile Lengths Based on Analysis of Soil Properties

Appendix IV-04E Installation of Utilities on Highway Structures

Appendix IV-04F Integral Abutment Design

Appendix IV-04G Installation Details of Precast RCB's

Appendix IV-04G 1 Skewed Precast RCB Installation Guidelines

Appendix IV-04G 2 Normal Precast RCB Installation Guidelines

Appendix IV-04H Checklist for Bridge Plans (SFN 17180)

Appendix IV-04I Pedestrian & Shared Use Facilities on Structures

DESIGN MANUAL	TABLE OF CONTENTS
Page 5	<b>Revised 4/8/09</b>

# CHAPTER V HYDRAULIC STUDIES AND DRAINAGE DESIGN

V-01 Hydrology

V-02 Bridges and Box Culverts

V-03 Urban Storm Drainage Systems

Appendix V-03A Rational Method - Runoff Coefficients

Appendix V-03B Time of Concentration of Small Drainage Basins

Appendix V-03C Rainfall Intensity – Duration – Frequency by District

Appendix V-03D Drainage Studies - Procedural Guide (Urban Design

Appendix V-03E Standard Drawings for Inlets

Appendix V-03F City Participation

Appendix V–03G Hydraulic Computation Forms

V-04 Small Drainage Structures for Rural Projects

V-05 Pipe Material Selection

Appendix V-05 A Pipe Culvert Backfill Heights

V-06 Permit Requests/ Drainage Reviews

## CHAPTER VI CADD MANUAL

http://www.dot.nd.gov/manuals/design/caddmanual/caddmanual-welcome.htm